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Art Therapy, Neuroscience and the Mind-Body Connection: A Literature Review

BY

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DEDICATION

This work is dedicated to my clients, and my late cousin David, whose courage and grace inspire me. It is a gift to work with creative energy, to be present in the moment intimately engaged in the human experience.

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ABSTRACT

The field of neuroscience and more specifically psychoneuroimmunology, is central in understanding the mind-body connection and is essential in evaluating the use of art therapy as a mind-body intervention. This comprehensive literature review will provide insight into the direction the art therapy community is investigating to further implement relevant mind-body interventions and research. In reviewing published literature in the field of neuroscience, psychology and art therapy directions for further research are identified. Research directed toward mind-body interventions in art therapy will lead to greater understanding and inform methods of practice in the art therapy and medical community.

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Chapter I

Introduction

Art therapy is a powerful tool that has been used in the medical setting for years (Ganim, 1999; Malchiodi, 1998, 1999a, 1999b, 2003; Pratt & Wood, 1998). Art therapy has been used as a means of connecting the mind and body in relation to health with many populations (e.g., cancer, chronic pain, stroke, HIV/AIDS, eating disorders, asthma) (Malchiodi, 1999a, 1999b) and to access the body's relaxation response and trauma (Malchoidi, 2003). In their work with clients, art therapists have recognized and witnessed the connection of the mind and body, transformation, growth and healing.

The medical community's interest in the mind-body connection has important ramifications in the field of art therapy. Early research on the mind-body connection by Simonton (1978) is an example to the medical communities' long-standing interest in the mind-body connection and is exemplified in Simonton's work with cancer patients. Malchiodi (2005), states "mind-body medicine is a popular term used to describe an approach that views the mind as having a central impact on the body's health" (p. 16). Pert (2002) speaks of the mind-body connection explaining that "neuropeptides and their receptors are a key to understanding how mind and body are interconnected and how emotions can be manifested throughout the body" (p.30). Lusebrink (1990) explains that images are "the bridge between body and mind, or between the conscious levels of information processing and the physiological changes in the body" (p.218).

Research in art therapy is only beginning to explore why art therapy is effective in mind-body intervention or method (Malchiodi, 1993, 1999a, 2003, 2005).

Advances in the field of neuroscience have set the stage for further understanding of how art therapy may mediate the mind-body connection. The works of Rossi (2002a, 2002b, 2004a, 2004b, 2005), Pert (1985, 1997, 2002a, 2002b, 2003), and Kiecolt-Glaser, McGuire, Robles, & Glaser (2002) are of great importance in understanding the mind-body connection and the influence of negative emotions on the immune system. This research may help to bridge the explanatory gap between the mind-body connection and the process of art therapy. The purpose of this literature review is to review studies of the mind-body connection and examine how it might be experienced in art therapy. Implications for art therapy practice are presented in light of this review.

Chapter II

Search Strategy

Following Mertens (1998), the search strategy adopted this review involves the use of PsycINFO, Ovid Medline, World Wide Web, and reference lists of relevant articles and texts. Limits for PsycINFO, and Ovid include searches for articles after the year 2000. Earlier references are included only if they are considered important seminal works. Key words used in this search include: “art therapy”, “neuroscience”, “emotion”, “mind-body”, “healing”, “immune system”, “psychoneuroimmunology”, “gene expression”, and “healthcare”. The Yahoo search engine was used for the World Wide Web searches. Further references were added in consulting with professionals with knowledge and expertise in this area of inquiry. Gathering data continued until the researcher found the references of the articles provide no further information relevant to the specific topic to be studied, and repetition of mentioned authors is encountered (Mertens, 1998).

Components of the Review

Components within the body of this review first address the limited research in the art therapy community in regards to the scientific understanding of why art therapy intervention is successful. Secondly, Rossi’s (2002) research on gene expression and mind-body healing is reviewed as a framework for understanding how creative expression affects the brain and potential ways the field of art therapy may incorporate this framework in future research as a way of studying the mind-body connection. Thirdly, the work of Pert (2002) is discussed from the neuroscience perspective, in terms of the expression of emotion through neuropeptides and their

receptors and how this relates to the mind-body connection. This research moves towards clarifying explanations for the benefits of art therapy especially as it relates to the expression of emotion in order to facilitate healing. Fourthly, Kiecolt-Glaser et al.'s (2002) research is examined regarding what the effect of negative emotion is on the immune system and how this negativity may impact the mind-body connection.

Finally the implications of this review are discussed as related to art therapy practice and possible direction for further research will be established.

Chapter III

Literature Review

History of Art Therapy Research

There is a scarcity of empirical research in art therapy, and varying opinions as to what make this the situation. Tibbetts (1995) suggests there is little interest in empirical research on the part of art therapists, and little emphasis placed on research in art therapy training programs to guide those who are interested. Rosal (1998) suggests that one school of thought debated as to whether or not art therapy research is even necessary. Rosal suggests if research is determined to be necessary, training programs should be tailored to meet and encourage this need. As the debate continues, and time passes, Vick (2001) discusses the action taken by the American Art Therapy Association in creating a Research Task Force, recognizing the need to support research in the field and various ways in which this may be facilitated (e.g., increased education requirements in formal research, research manuals). McNiff (1998), Malchoidi (1995, 2003), and Kaplan (1998, 2001) all emphasis the lack of research in the art therapy profession, both qualitative and quantitative, and the need to consider the benefits of empirical research to understand why and how art therapy is successful.

Numerous case studies exist documenting the power of art therapy or the meaning of images (Kaplan, 2001). Few studies venture into hard science. Lusebrink (2004), Riely (2004), Boyko (2005), Kaplan (2000), Hass-Cohen & Carr (2008) and Belkofer & Konopka (2008) are a few of the exceptions. These researchers have provided research into the science of the mind-body connection as

it relates to art therapy. Lusebrink (2004) provides the art therapist with an understanding of the different areas of the brain that are activated by different media and techniques used in art therapy. For example Lusebrink (2004) identifies the primary visual cortex as discerning not only an object's shape, and color, but the ability to process movement and pattern recognition. The primary somatosensory cortex is identified in tactile sensory information (Lusebrink, 2004). Lusebrink (2004) further relates that when working with "the rehabilitation of stroke patients, Alzheimer's patients, and chronic schizophrenics, kinesthetic action can serve as a reconstitutive agent in that it can stimulate motor memories including those sequences of motor actions relegated to the basal ganglia. Haptic sensory stimulation can bypass impaired brain areas and help to reconstitute memories (Menzen, 2001)" (p. 129). Lusebrink (2004) also suggests that "the sensory modality of touch involves motor movement. Sensory stimulation exploration, and play with art media facilitate imagery formation. For developmentally impaired children and adults, tactile interaction with art media stimulates new development" (p. 129).

Riley (2004) addresses the importance of the brain function in relation to imagery, visualization, and how this can be helpful in working with clients. Left brain right brain activity is also addressed, as it relates to the creative process. Riley (2004) also notes that "the notion of body memory is based on the concept that the body informs the mind and the mind informs the body – there is no division" (p.185). Riley (2004) suggests a technique through which the client can facilitate this connection and thus "may reduce stress factors that do influence the immune system" (p.186). This point is crucial in understanding the need for further research

in this area. It is understood and accepted that the mind-body connection exists and is both powerful and healing. However, once again we arrive at the question; how and why is this so?

Boyko (2005) conducted research based on the work of Rossi, using neuropsychological measurement in a single art therapy case study. Boyko (2005) was interested in "brain based changes as a result of the art therapeutic process," (p.1). This initial research in neuropsychological measurement documents changes in the client's art work over twelve sessions and suggests further research in this area would benefit greater understanding the art therapeutic process. Boyko (2005) "examined certain aspects of brain function through the use of specific neuropsychological and art therapeutic pre and posttests and the creative process of art therapy"(p. iv). For example, through her research, Boyko (2005) relates a client's visuospatial/constructional capabilities may improve with the use of the art therapeutic process.

Carr (2008) focusing on the thalamus, the amygdala and the anterior cingulate cortex (ACC), provides insight into the unique opportunity for art therapy to activate these centers in the brain.

> Art therapy practices seem to engage the ACC as well as complex regulatory centers in the PFC [prefrontal cortex] that utilized explicit and implicit memory to problem solve and create novel ways to diminish expressed conflicts. Multimodal contexts available during art therapy invite creative, comprehension-oriented and expressive possibilities that avoid becoming simplistically liner or impulsive. The bilateral orientation of art therapy draws

> upon the functional differences in both hemispheres to facilitate individualized, coherent and integrative resolutions of present, past and evolution-based disruptions in self-functioning within a safe, manageable psychosocial context. (Carr, 2008, p.58)

Carr (2008) relates how various neurotransmitters, neuromodulators and hormones in the body may be activated in various art therapy processes. Carr (2008) specifies acetylcholine, dopamine, epinephrine, adrenaline, norepinephrine, noradrenaline as important neurotransmitters in linking neuroscience research and art therapy. Carr (2008) concludes, "by engaging intrinsic communication processes facilitated by neurotransmitters and hormones, art therapy seems poised to enable positive therapeutic changes while possibly enhancing synaptic plasticity and creating multi-tiered psychological outcomes"(p. 89). In other words, a client engaged in the therapeutic art process can initiate changes to the body's chemistry, resulting in new learning, neurogenisis and mind-body healing.

Hass-Cohen (2008), an art therapist interested in clinical neuroscience has coined the term "art therapy relational neurobiology principles" (p. 21) (ATR-N) She uses this term to foster a new framework for art therapy in practice, research and theory. Hass-Cohen (2008) relates current neuroscience research in suggesting various art therapy techniques may prove beneficial in activating various areas of the brain. "The ability of ATR-N approaches to ignite implicit memory and trigger integrated right and left hemispheric functioning may be uniquely posed to decrease the stress response, regulate disturbing emotions, increase a sense of mastery and control, and expand relation interconnectedness" (Hass-Cohen, 2008, p. 281).

Therefore, both the left and right hemisphere are activated in art therapy via the corpus callosum. It is this connection that promotes the possibility of integrative thinking that supported the client in talking about their images and feelings.

Belkofer & Konopka (2008) in a single case study evaluated the electrical activity of the subjects' brain after creating art for an hour. Using electroencephalograph (EEG) revealed a statistical difference in neurological activity prior to the creating art compared to after creating the art, suggesting that EEG is a beneficial tool for research in art therapy (Belkofer & Konopka, 2008).

Neuroscience

The field of neuroscience and more specifically psychoneuroimmunology has devoted much research that is contributing to the understanding of the mind-body connection. Psychoneuroimmunolgy has been said to be "providing the empirical evidence for many associations, which were until recently seen as mere folklore" (Viljoen, Panzer, Roos, & Bodemer, 2003, p.332). Psychoneuroimmunology has been defined as "the study of the interactions between behaviour, the brain, the endocrine system and the immune system" (Vijoen et al. 2003, p. 333). Ader, often referred to as the father of psychoneuroimmunology, (Azar, 1999) acknowledged that even when his book was published in 1981, the concepts of psychoneuroimmunology, "the notion that the immune system was not totally autonomous, but represented another specialized adaptive mechanism that was integrated with other homeostatic processes" (Ader, 1991, p. xxv), was not generally accepted. By the second edition, in 1991, research confirmed that there is a relationship between the immune system and the brain (Ader, 1991). Neuroscience

is providing a scientific framework through which we can further understand the therapeutic process in various forms of therapy. Grosjean (2005) suggests the use of neuroscience to understand the therapeutic process in psychotherapy. Grosjean (2005) details the history and development outlining the importance of a basic understanding of memory and learning and their connections to the autonomic nervous system.

Siegel (2007) explores mindfulness, and more specifically, mindful awareness. He describes that a secure attachment and mindful awareness promote well-being and resilience. Siegel (2007) integrates interpersonal neurobiology combining neuroscience and attachment research to illuminate the attunement of mindfulness.

Dales & Jerry (2008) examine attachment theory and the therapeutic relationship through the lens of developmental neurobiology. Their research recognizes “right-hemisphere to right-hemisphere emotional and relational processes-moving away from the traditional emphasis on “left-brain” verbal and cognitive processes” (Dales & Jerry, 2008, p. 283).

Rossi (2002) proposes a four stage creative cycle, which incorporate findings from neuroscience to map the process an individual experiences in integrating mind and body. Rossi suggests that in following the four stage creative process one can tap into the body’s natural healing and problem solving ability, resulting in novelty, numinosum, neurogenesis and healing. The four stages Rossi outlined are: gathering, incubating, insight and integration. Rossi details what may be happening to the individual at each stage, providing signs and signals the therapist can

examine in the individual that may suggest how the individual is progressing through the stages. Rossi also specifies *implicit heuristics* the therapist can utilize to facilitate the individual's process. Rossi, a student of Milton Erickson, borrows from therapeutic hypnosis as a means for the client to experience a state in which the client is able to explore on various levels what they are experiencing (Rossi, 2002). Where classical hypnotic suggestion seeks to control a behaviour or outcome, Rossi (2002) states "the classical notion of hypnotic suggestion as a method of conditioning, programming, or forcing compliance with the therapist's directives." (p. 335), Rossi is using implicit heuristics to have the client access their own need and decide on their own what the outcome will be. I suggest that mind-body interventions in art therapy be best understood or at least partially illuminated through Rossi's proposed four stage creative cycle.

Psychobiological Science of Mind-body Healing.

Rossi (1993) presents evidence that the mind-body connection exists and can be measured. He notes the mind can be drawn upon to heal the body, and through left and right brain processing insight is gained into how the mind-body systems interface.

Rossi poses the following questions in reference to the mind-body connection; "Where is the connection between mind and body? Can you see it under a microscope? Can you measure it in a test tube?" (Rossi, 1993, p. xv). He further reinforces that "there really is a mind-gene connection! Mind ultimately does modulate the creation and expression of the molecules of life!" (Rossi, 1993, p. xvi)

The question is how can we use art therapy as an intervention to facilitate this healing?

With the knowledge that mind-body communication is a natural process, Rossi (1993) explores the possibility of utilizing and activating this communication to facilitate our own healing or well-being. Rossi (1993) isolates "the "limbic-hypothalamic system" of the brain as the major mind-body connector modulating the biological activity of the autonomic, endocrine, and immune systems in response to mental suggestion and beliefs" (Rossi, 1993, p.7). Rossi (1993) then explains, "the transformations between mind and body are called information transduction." (Rossi, 1993, p. 23) The question becomes, how can art therapy be used to facilitate information transduction in a way that specifically targets the limbic-hypothalamic system connecting mind and body?

Accessing and Activating Mind-body Healing

Rossi (1993) suggests state-dependant memory, learning and behaviour (SDMLB) is key in the mind-body connection as it "function[s] as a bridge between mind and body" (Rossi, 1993, p.40). Therefore "what is learned and remembered is dependent on one's psychophysiological state at the time of the experience" (Rossi, 1993, p. 47). Rossi (1993) further explains that in our everyday life we generally experience SDMLB, when we experience a creative moment, (e.g. in dreams, or artistic creativity) which are " '*the basic unit of original thought and insight as well as personality change*"' (p.53). Rossi (1993) illustrates that from the psychobiological perspective, "experiencing a creative moment may be the phenomenological correlate of a critical change in the molecular structure of proteins with in the brain

associated with learning (Kimble, 1965) or the creation of new cell assemblies and phase sequences (Hebb, 1963)" (Rossi, 1993, p.53). Rossi concludes, "shock and stress strongly encode traumatic events and simultaneously impair effective coping behavior that leads to the genesis of many types of mind-body dysfunctions that are typically called "psychosomatic problems" (Rossi, 1993 p. 57).

The mind and body are connected and do communicate. To outline how they are connected and how they communicate, Rossi (1993) presents that the state-dependent theory of mind-body communication and healing can be related through the following connected hypotheses. The limbic system is the connecting link between mind and body. State dependent memory learning and behavior processes encoded in the limbic-hypothalamic system are transducers between mind and body. In accessing and reframing SDMLB mind-body healing is initiated whereby symptoms and problems are encoded. This encoding can be both psychologically and physiologically (Rossi 1993). Rossi (1993) relates, "that *mind-body information transduction and state-dependent memory, learning and behavior* mediated by the limbic-hypothalamic system are the two fundamental processes of mind-body communication and healing" (p. 68). Rossi (1993) further explains:

> State-dependent memory, learning and behavior phenomena are the "missing link" in all previous theories of mind-body relationships. They bridge the mysterious gap between mind and body; they are the common denominator between traditional Western medicine and all the holistic, shamanistic, and spiritualistic approaches to healing that depend upon highly specialized cultural belief systems, world view, and fames of reference. (p.68)

Rossi (1993) works with clients to facilitate healing through mind-body communication in two ways *"(1) recognize their symptom as important mind-body signals and (2) utilize their psychological problems as opportunities to explore and actualize their creative resources….symptoms are converted into signals and problems are reframed into creative resources*" (p.92). Rossi (1993) emphasizes the client's own inner resources to promote, encourage, and activate the bodies own healing.

Rossi (1993) outlines several approaches or tutorials to facilitate mind-body communication when working with clients. I suggest that several of the techniques and skills used in these tutorials are transferable to employing art therapy to further facilitate mind-body communication and healing. One such approach Rossi (1993) outlines, is derived and adapted from a drawing technique, by Mills and Crowley's (1986) "Inner Resource Drawings". This technique has a child draw "(1) the problem as it is currently experienced; (2) the problem when it is resolved; and (3) how to get from the first to the second drawing" (p.109). Once again the client is encouraged to explore their own inner resources working with the identified problem, to facilitate the body's own healing response.

Another of Rossi's (1993) tutorials titled "Symptom Scaling and Healing" (p.110), directly incorporates both the left and right brain to facilitate the client in accessing and reframing a problem or a mind-body symptom. More specifically the client is asked to "*experience*" the problem, a right hemispheric process, and then "*scale*" that problem a left hemispheric process, the client incorporates these functions to further promote reframing of the problem and greater access to mind-

body healing. For example, the client is asked to rate the problem on a scale of 1 to 10. One, being low on the scale, such as the problem is not of great concern or discomfort, and 10 considered to be high on the scale where the problem is of great concern and discomfort. Whether the technique has a focus of shifting from right to left cerebral hemispheres, as a way of accessing and reframing symptoms and problems, or using ultradian healing responses, (e.g. allowing 5 – 20 minutes of uninterrupted quiet work to allow the ultradian mind-body signals for healing), these techniques all include supporting the client in recognizing the natural mind-body signals (Rossi, 1993). These techniques are transferable to art therapy, which will be discussed later in this review.

Overview of Mind-body Communication and Healing

Rossi (1993) has broken down mind-body communication and healing into 3 levels: the mind-brain, the brain-body and the cell-gene. Rossi (1993) outlined the systems of mind-body communication to include the autonomic nervous system, endocrine, immune and neuropeptide systems. Rossi emphasizes “they all communicate with one another by many of the same messenger molecules that encode state-dependent memory, learning and behavior (SDMLB)” (Rossi, 1993, p. 136). Rossi (1993) explains how each of these systems uses unique messenger molecules, the autonomic nervous system uses neurotransmitters, endocrine system uses hormones, the immune system uses cytokines, and the neuropeptide system uses neuropeptides. Rossi (1993) emphasizes:

> Messenger molecules and their receptors simultaneously serve two major interlocking functions that enable them to bridge the so-called “gap” between

> mind and body. Messenger molecules are (1) the major pathways of communication between and within all the regulatory systems of mind and body and, at the same time, (2) they serve as the ultimate keys for the state-dependent encoding of the types of personal emotional experience and behavior that have always been of relevance for psychotherapy and mind-body healing. (p.159)

These messenger molecules are crucial in understanding at the molecular level how the mind-body connection is established and how to integrate these molecules in furthering our understanding of mind-body healing, and ultimately art therapy interventions.

Autonomic Nervous System.

Rossi (1993) suggests:

> The ultradian rhythms between 20 and 90 minutes, for example, are the typical time periods within which most significant human psychosocial activities and mind-body healing processes take place. (e.g., the basic rest-activity cycle underlying optimal performance in everyday life, psychotherapy and meditation sessions of all sorts, religious rituals…[Lloyd & Rossi, 1992a]). (p. 159 – 160)

Rossi further suggests that ignoring the body's rhythms (e.g. ultradian) disrupts the mind-body's natural healing response, creating a source of stress that interferes with messenger molecule-cell receptor system. An art therapy intervention which incorporates the ultradian rhythms would therefore benefit and facilitate the clients' natural mind-body healing response. For example encouraging clients to

trust the art process (Malchiodi, 2003) and draw or create from within to support the client in recognizing for example the comfort in their body (Rossi, 2004). Rossi (1993) reminds professionals to view the various phases of the ultradian rhythms as optimal for healing stress and mind-body issues at the heart of many interpersonal and psychodynamic challenges.

Endocrine System.

Regarding the endocrine system, Rossi states "the neurotransmitters of the autonomic nervous system, the hormones of the endocrine system, and…the immunotransmitters of the immune system, all function as "messenger molecules" or keys that open the receptor locks on the surface of the cells. *This messenger molecule and cell-receptor communication system is the psychobiological basis of mind-body healing, therapeutic hypnosis, and holistic medicine in general*." (Rossi, 1993, p. 190)

For example to tap into the clients' natural psychobiological ultradian rhythms, Rossi (1993) suggests to watch for when:

> The patient's behavior indicates that the rest phase of an ultradian rhythm is being experienced…the patient will appear to be in a quiet moment of reflectiveness or inner reverie: the body becomes immobile; reflexes such as eye blinking or swallowing may be slowed or absent; the eyes may manifest a "far away' look and simply close spontaneously for a moment or two; heart beat and respiration are slowed. (p.203)

Rossi (1993) suggests the importance of having the client and therapist use words such as *wondering, relaxation and sleep*, and *comfort* that may elicit right-

hemispheric processing, when working with the ultradian rhythms. The tutorial Rossi (1993) outlines for clients to recognize and facilitate the ultradian healing response may also be utilized in art therapy. In the art therapy session, the therapist may wonder aloud what the client may be experiencing as the client begins to relax. The art therapist encourages the client to explore the comfort he or she is experiencing in their body and encourages the client to continue to relax similar to taking a nap. The client can then explore these sensations of relaxation and sleep using their own inner imagery to create art, providing an opportunity for reframing the problem and mind-body healing. Rossi (1993) reminds the client that they may not be aware of the specifics of the healing that has occurred, but that this healing state can be initiated several times a day. Rossi (1993) explains "wondering absent-mindedly about a personal problem during the comfort of a psychobiological ultradian rest period is a natural way of accessing and spontaneously reframing and resolving the state-bound encoding of the problem" (p. 204). This wondering is the very process an art therapist is asking a client to activate when working in the art with the clients own inner imagery during an art therapy session. Ultradian healing as outlined by Rossi (1993) are explained as:

> Optimal patterns are undoubtedly associated with happy memories of health, well-being, joyful experiences, creative work, and effective coping. They are the *raw material or inner repertory of resources* that our accessing formulas seek to utilize in healing. The fundamental task for each individual is to learn how to access and utilize his or her own unique inner repertory of

psychobiological resources that can ultimately modulate biochemical processes within the cell. (p. 216)

Rossi (1993) outlines a specific exercise for the client to access the ultradian healing response. He suggests when the client is aware they are tired, to explore the idea of how comfort could feel, now, in their body, and how this sensation, now, spreads through the body. The client is encouraged to actively wonder how the unconscious uses previous life experiences as healing. Rossi (1993) suggests that the client will begin to recognize an awareness of self and that time has passed by. He encourages the client to recognize the comfort they experience and the healing that has taken place. The task laid out by Rossi is at the essence of art therapy, as the client literally draws these inner resources when creating art and it is possible that at times the art therapy time can be spent with an ultradian rhythm.

Immune System.

”The research of Ader and the “new immunologists,” however, has created an unprecedented bridge between mind and body: Their experimental research demonstrates how behavioral conditioning can inhibit or enhance immune system response (Ader, 1981, 1983, 1995: Ghanta, Hiramoto, Solovason, & Spector, 1985; Solomon, 1985)“ (Rossi, 1993, p. 217).

“Currently being demonstrated that the immune system can be influenced by mind methods with appropriate education and training” (Rossi, 1993, p.226), more specifically, studies have shown increased neutrophils function with relaxation training (Peavy, Lawlis, & Govern, 1985;), facilitating neutrophil activity, with belief

through imagination and imagery in drawing pictures (Schneider, Smith & Witcher, 1884).

> Hall et al. (1992b) confirms the ability of human subjects to voluntarily modulate their innate or nonspecific immunological competence with a "cyberphysiological strategy" that utilized relaxation and the subjects' personally selected imagery to enhance neutrophil adhesiveness. This study is of particular interest because it found that specific imagery focusing on only one aspect of immune functioning (neutrophil adhesiveness) was able to enhance that function while leaving other immune parameters…unchanged. (p. 227)

To fully understand the importance of the above research, "neutrophils are [a] type of white blood cell…They are phagocytic, meaning that they can ingest other cells, though they do not survive the act. Neutrophils are the first immune cells to arrive at a site of infection" (WiseGEEK, 2009). These findings provide some insight and understanding into how art therapy interventions may be incorporated to facilitate the client's immune function and encourage further research on why art therapy the interventions are successful.

As for a theoretical approach, Rossi (1993) outlines "adherence to the basic principle of utilizing the subject's own personal imagery that presumably has been effectively encoding state-dependent memories and associations that make up the

subject's "repertory of inner resources" which can be accessed for healing. Second, the 30-minute period of "cyberphysiologic exercise" falls within the expected parameters of 20 minutes plus or minus about 10 minutes that defines the ultradian healing response" (Rossi, 1993, p. 228). Perhaps too, this may provide insight into the length of time the client is creating art, as to ensure ultradian healing response may be activated.

Smith, Mckenzie, Marmer and Steele (1985) found that through meditation and training some people are able to activate their own mind-body healing. Smith et. al. (1985) concluded that:

> If it proves to be the case that humans can significantly modulate their immune response, then two important outcomes may occur. The mechanism of infectious or neoplastic disease onset associated with various psychological processes such as hopelessness or depression can possibly be better understood. Perhaps, also, intentional modulation can be used therapeutically to increase or decrease immune response, depending on the particular disease state. (p. 2111)

Rossi's theory of intentional modulation could most certainly be applied to art therapy intervention in much the same way. Some clients, who are receptive and able to participate in the following manner, could learn to draw their immune response to stimulate the mind-body response to initiate changes that may influence the immune response. This in turn could affect psychological process as stated by Rossi (1993), such as hopelessness and depression. Some clients may also use their art process to provided direction to their own immune system response to

various infections or disease. Quite simply a client could create their immune system stepping up to fight a tumor, or perhaps, depicting in their art, drugs targeting the tumor.

Rossi (1993) further provides evidence for mind-body response, citing current research that suggests that “life change stress”, “coping ability” and “cognitive reframing” are significant factors in determining whether stress will have a positive or negative effect on the immune system (p.247). Temoshok’s (1991) research revealed those who express emotion most often, experience an increase in lymphocytic infiltration, a decrease in the mitotic rate of a tumor, resulting in lower degree of tumor thickness. This may be an opportunity for clients to use their own creative images to work systematically through their body, e.g. Immune system to fight disease. Incorporating opportunities for the client to create art. based on the emotional space of positive healing and safe outcome could facilitate a building block from which to transduce emotions into positive and effective mind-body healing interactions. This conceptual framework is another area in need of more research. Rossi (1993) goes on to explain that;

> At this point we can hypothesize that emotions are being transduced into hormonal messenger molecules within the limbic-hypothalamic-pituitary system at the mind-brain level…We must now find the actual mechanisms involved in each step of the entire informational loop between the psychosocial level and the gene before we can design a truly effective mind-body therapy. (p. 248 – 249)

This aspect of neurology research may lead us to using art as a means of assisting the reframing process which may have a positive effect on the immune system.

Rossi (1993) imparts, “the art and science of these forms of mind-body healing involve essentially a creative and constructive process that individuals must explore in their own way as they learn to maximize their psychobiological potentials” (p. 251). It is this very process that I believe is at the heart of art therapy and art therapy interventions, and may therefore possibly facilitate mind-body healing.

Neuropeptide System.

Rossi (1993) contrasts:

> The fundamental difference between our psychobiological approach of conceptualizing symptoms as maladaptive forms of information transduction that can become important signals for creative personal development, and the more typical stance of behavioral medicine and classical conditioning therapy which regards symptoms as problems that have to be extinguished (Gentry, 1984). (p. 292)

Art can easily be used to work with symptoms. One example would be to use the three-part technique “Inner Resource Drawing,” (Mills & Crowley, 1986). The client would first draw the symptom as it is currently experienced, then create an image depicting the symptom when it is resolved, and finally, how the client would get from the first image to the second image. Again, this point is another example of reframing. This scenario then lends to the question, how do we view mind-body healing? This awareness is crucial in understanding how to use interventions. Rossi (1993) states:

> Our psychobiological approach uses these data by accessing the state-dependent memory, learning, and behaviour systems that encode problems and reframing them into creative functions. Many types of chronic pain and recurrent symptoms and problems are actually information transducers that amplify the minimal stress signals for the mind-body. (p. 292)
>
> Rossi (1993) states:
>
> It has been hypothesized (Rossi, 1990a, b) that the most vivid demonstration of how messenger molecules, particularly the neuropeptides, may be involved in most forms of psychotherapy is in the cathartic reactions.
>
> Catharsis,[described as] the dramatic emotional release of suppressed and usually traumatic state-dependent memories of significant life events (p. 304 & 307).

It is interesting to note that in art therapy, Malchiodi (1999) and Hiltebrand (1999) relate the importance of emotional release in art therapy in expressing and externalizing feelings to facilitate healing. Liebmann (2008) also speaks specifically to the power of catharsis in art therapy.

Rossi states “I hypothesized that *the arousal and relaxation phases of cathartic psychotherapy and emotional insight are mediated by the release of ACTH and β-endorphin from their mother molecule, POMC (proopiomelanocortin), via the basic process of mind-body information transduction in the limbic-hypothalamic-pituitary system*” (Rossi, 1993, p.307).

The Relationship between Neuroscience and Art Therapy.

We have reviewed how information is carried and affects the body, now we need to explore how the body is affected at the gene level. Rossi (2002a, 2002b, 2004a, 2004b) has done extensive research on gene expression, neurogenesis, and the human experience in mind-body medicine, through the scientific discipline of psychosocial genomics. The terminology relevant to this field of study deserves attention to fully understand the research. The following terms and their definitions are necessary in understanding the depth and magnitude of Rossi's research.

Rossi (2002b) explains that functional genomics explores gene expression from both the body and the environment and the impact it has on health and illness of the body. This is important, as we are not living in isolation. We are interactive with our environment. Therefore, our symptoms are not only based in our bodies. We are not acting in isolation of our environment nor are we acting independently of one another. Psychosocial genomics have to do with an individual's lived experience including both social and cultural experiences (Rossi, 2002b). Rossi (2002b) further defines novelty-numinosum-neurogenesis effect as activities such as art drama, dance and poetry that function through gene expression to encourage brain growth and healing by fostering changes in stem cells. The following definition of stem cells is provided by the National Institute of Health website http://stemcells.nih.gov/info/basics/basics1.asp, What are stem cells, and why are they important?(2009):

> Stem cells have the remarkable potential to develop into many different cell types in the body during early life and growth. In addition, in many tissues they serve as a sort of internal repair system, dividing essentially without limit

> to replenish other cells as long as the person or animal is still alive. When a stem cell divides, each new cell has the potential either to remain a stem cell or become another type of cell with a more specialized function, such as a muscle cell, a red blood cell, or a brain cell.

Rossi (2005) explains that immediate early gene expression, within seconds, can take life events and psychosocial cues, which can stimulate changes in the cell regarding health and illness. He further relates that this change or transformation of environmental information and energy link the mind and body. This is where Rossi (2005) stresses neuroscience provides the key and psychology now needs to research.

At the root of Rossi's work is the idea that 'the mind drives the body, which drives the genome" (Rossi, 2002b, p.23). Rossi includes the genome as part of the mind-body explanation. Rossi's study of gene expression suggests "psychological processes and behavior can modulate gene expression…suggesting that psychosocial genomics could become the foundation and common denominator of alternative and complementary approaches to mind-body medicine" (2002b, p.24). It is this point that suggests a scientific explanation of how and why art therapy is successful in mind-body interventions. Rossi (2005) explains that in psychotherapy, as the client tells and recounts their story, the client is at the same time reshaping their experience. This recall process initiates gene expression. To understand the concept of gene expression, the following examples provide insight into the activation and expression of genes. Rossi (2002b) recounts;

> Psychosocial stress, for example, can turn off the early activated interleukin-2

> gene so that the immune system cannot communicate well and we are left more vulnerable to opportunistic infections. Positive psychosocial experiences with children, on the other hand, can turn on the interleukin-2 gene within 1 or 2 hours to facilitate molecular communication, healing, and health. (p.27)

Rossi (2002b) suggests that this could imply that psychotherapy and healing arts could have a great impact on psychoneuroimmune system. This further emphasizes the notion that art therapy as it relates to psychotherapy, the healing arts, and the mind-body connection, could also be explained by this process. Positive experiences in art therapy, such as transformation, growth and healing, for example, may also turn on the interleukin-2 gene to facilitate healing. As a client experiences new insight and meaning, neural networks of the brain are reconstructed (Rossi, 2005). This notion is perhaps the genesis in answering how and why art therapy is successful as a mind-body intervention. The importance of this finding for future research in art therapy is further emphasized as Rossi (2005) states:

> The implication of current neuroscience research is that this recall and creative replay activate gene expression, protein synthesis and the reconstruction of the neural networks of the brain (usually called brain plasticity). This suggests that the efficacy of psychotherapy on the molecular-genomic level can be sharpened and focused by expanding upon the major neuroscience research techniques for turning on gene expression and brain plasticity—experiences of novelty, enrichment, and exercise. (p.4)

The use of art therapy as a “creative replay”; as a way of turning on “gene expression and brain plasticity”, needs further exploration. Research techniques need to be expanded to enable specific strong meaningful art therapy interventions.

Rossi emphasizes the “DNA microarray technology is making it possible to assess gene expression profiles in human blood in real time that could be used to identify changing psychobiological sates.” (Rossi, 2005, p.8) This technology would perhaps make it possible to measure these effects in art therapy as it pertains to the mind-body connection, and healing. Rossi (2004a) further details this technology is “able to measure the initiation of gene expression and brain plasticity in response to the creative replay of the novelty-numinosum-neurogenesis effect within the typical time frame of a single session of psychotherapy now exists and needs support from the psychotherapeutic community” (p.1). These findings call to the art therapy community to conduct research in this area to confirm and validate these ideas. It is quite possible that research in this area may provide information and/or answers to the question of how and why mind-body interventions are successful in art therapy.

Pert’s research and exploration of mind-body communication and healing further supports Rossi’s findings. Pert’s (2002) neuroscience research suggests “neuropeptides and their receptors, are crucial in understanding how mind and body are interconnected and how emotions can be manifested throughout the body” (p.30). Pert’s research has noted that the limbic system (includes the hypothalamus, the pituitary gland, and the amygdale) is not only important to emotions is also crucial for receptors and neuropeptides. Pert, Ruff, Weber, & Herkenham (1985) have also found that neuropeptide receptors are located throughout the body, and

that the neuropeptides are the information carriers of the body. The information they carry sends messages throughout the body to other neuropeptide receptors. It is these neuropeptide receptors that hold the “keys to the biochemistry of emotions” (Pert, 2002, p. 31). Pert’s (2002) research has indicated that the brain and the immune system have the same receptors. Therefore the same neuropeptide can influence the brain, the immune system and the body. Pert (2002) explains receptors for cholecystokinin have been found in the spleen (important to the immune system), and in the brain. This example emphasizes the connection of the mind and body. Pert (2002) suggests this connection needs to be extended further for when we understand how emotions affect the body on the level of neuropeptide molecules, we will also understand more about how emotions may aid our understanding of illness and hopefully, how to better address illness. This brain and immune system overlap is perhaps how art therapy interventions may tap into the mind-body connection. As expression of emotion in art process is experienced, perhaps the neuropeptide molecules of the emotions are traveling to receptors in for example both the brain and the spleen. This expression of emotion (abreaction) or big emotional releases (catharsis) as mentioned earlier by Rossi (1993) can also be experienced in art therapy, and considered to be part of the mind-body intervention.

The body is a “network”. To approach a more elaborate understanding of this complex network, one needs to study and examine:

> Neuroscience, endocrinology and immunology…that these 3 areas are actually joined to each other in a bidirectional network of communication and that the information “carriers” are the neuropeptides. There are well-studied

> physiological substrates showing that communication exists in both directions for every single on of these areas. (Pert, 2002, p.34)

The idea of the body being conceptualized as a “network”, provides further support and understanding, enabling a therapist/researcher to clarifying this complex interactive system in relation to the mind-body connection and art therapy interventions, thereby supporting art therapy through neuroscience, developing body/mind theory, and constructing an art therapy mind-body connection model which suggests a working application for art therapists.

Research has indicated that emotional expression has shown positive health outcomes (Pennebaker, 1997; Simonton, 1978; Webster, 1999) and also “generates balance in the neuropeptide-receptor network and a functional healing system” (Pert, Dreher & Ruff, 1998, p.1). Pert et al. (1998) explain emotions as “a bridge between mind and body” (p.2). Kiecolt-Glaser, McGuire, Robles, & Glaser (2002) have shown that negative emotions have been linked to certain health risks. Kiecolt-Glaser, McGuire, Robles, & Glaser (2002) also found positive relationships impact the immune system resulting in enhanced health. Perhaps this is also true of the client therapist relationship and may therefore suggest the importance of a strong and positive working alliance (Grosjean, 2005). This phenomenal experience is achieved in art therapy as the art itself provides an opportunity for the therapist to also experience first hand the art experience with the client. Also researching in the area of mind-body communication and healing, focusing on the expression of emotion, depression and the immune system, are researchers Kiecolt-Glaser and Glaser. Kiecolt-Glaser, & Glaser (2002) outline the effects depression can have on the

immune system, and levels of morbidity and mortality. Further exploration concluded that “immune modulation by psychosocial stressors or interventions can lead to actual health changes, with the strongest direct evidence to date in infectious diseases and wound healing” (Kiecolt-Glaser, McGuire, Robles, and Glaser, (2002a), p. 15), they further related that “distress-related immune dysregulation may be one core mechanism behind a diverse set of health risks associated with negative emotions” (p. 15). Kiecolt-Glaser et al. (2002a) compiled previous studies that found relaxation and hypnotic suggestion have been employed as interventions and have influenced immune functions. Kieclot-Glaser, McGuire, Robles, Glaser (2002b) also use exercise, and cognitive behaviour therapy, but suggest interventions have been few in number, often only “single sessions using imagery and hypnosis” (p. 540). The researchers also suggest the need for longer follow up. When looking at art therapy as a mind-body intervention, perhaps the healing and growth witnessed may be understood in terms of the expression of emotion which encourages on a molecular level the neuropeptide and receptors of the body to communicate with other systems of the body. Perhaps the biochemical substrates of emotion released through self-expression in art therapy are carried by neuropeptides throughout the body, and encourage healing throughout the “network”. Pert et al. (1998) conclude, “that mind-body interventions, which facilitate emotional expression, can result in physiological healing” (p.2). Art therapy, which explores emotional expression as related by Malchiodi (2007) & Hiltebrand (1999), may therefore be essential in mind-body healing.

Gabour Maté (2002) supports Pert's (2002) research in relating that the body will say no when or before we acknowledge or know that something is wrong. He links emotional repression, with disease in the body and outlines case examples of ALS. Maté (2002) suggests "we have lost touch with our gut feelings designed to be our warning system,"(p.36). Perhaps this is a space by which art therapy can connect us again with our instincts through the incorporation of our own inner imagery in art therapy interventions. Perhaps by using art therapy intervention for a client to explore and release pent up emotions, a client may overcome physical ailments and connect mind and body.

Maté (2002) suggests that individuals need to look at painful emotional realities to overcome physical ailments such as those seen with ALS. Perhaps art therapy would be a vehicle for such clients to utilize in the exploration and release of emotions.

Maté (2002) relates that emotional release is an important key in explaining why not all smokers for example get cancer. Maté (2002) relates several processes are involved in cancer: "DNA damage… failure of DNA repair and/or impairment of regulated cell death. Stress and the repression of emotion can negatively affect both of those processes," (Maté, 2002, p. 92). Understanding the research contributed by Kiecolt-Glaser & Glaser (2002) and Pert (2002) in relation to stress and repression of emotion and the impairment of the immune system, and levels of morbidity and mortality is important. Maté (2002) emphatically indicates "in numerous studies of cancer, the most consistently identified risk factor is the inability to express emotion, particularly the feelings associated with anger. The repression of anger is not an

abstract emotional trait that mysteriously leads to disease. It is a major risk factor because it increases physiological stress," (Maté, 2002, p. 99). Other risk factors Maté (2002) identifies are helplessness and lack of social support, which echo the findings by Kiecolt-Glaser, McGuire, Robles, & Glaser (2002), reiterating positive relationships impact immune system resulting in enhanced health.

Art Therapy

There are various definitions of art therapy depending on the philosophical perspective one represents. Generally, one school of thought views the art as therapy, and the other art as psychotherapy. Art as therapy suggests that the process of making art is therapeutic, that the creative process is healing, providing an opportunity for growth and fulfillment and expression. For instance, art therapist Edith Kramer (2000) suggests that the act of creativity is healing and transformative. Art psychotherapy suggests the art aids communication with the therapist that the art is seen as a form of symbolic language and the image itself is of great importance. For example, art therapist Margaret Naumburg (1966) views art as a way to access unconscious expression, and the communication in and of art to be symbolic.

As the profession of art therapy has developed, recognition of the process of making therapeutic art has grown. For example, hospital art programs have been developed to provide patients with opportunities to foster creative expression. Through creative expression, patients have an opportunity to reduce their sensation of pain, feel a sense of mastery and control of their situation, and at the same time fostering self-expression, all leading to a greater sense of wellbeing. In recognition of the benefits of art therapy, Malchiodi (2007) reminds that "art therapy has been

acknowledged as a “mind-body intervention” by the National Center for Complementary and Alternative Medicine, in recognition of the power of self-expression and the creative process in mental, physical, and spiritual health” (p. 40).

Art as Therapy

Kaplan (2000) relates that acknowledging recent breakthroughs in research suggests that we shift our focus to art as therapy as apposed to arts psychotherapy. Kaplan (2000) encourages art therapists to identify what it is that sets the art therapist apart from the “well-intentioned and psychologically aware artist” (p. 103). Through current research Kaplan (2000) suggests that “(a) art making is inherently therapeutic; (b) art therapists offer something that another professional is unlikely to provide” (p. 103). Kaplan (2000) suggests the art therapist needs to be aware of current research, and bridge the art and the science ways of knowing. “Art therapy’s greatest power resides in using art as therapy. This power…originates in the nature of art itself” (p. 103).

Kaplan (2000) suggests that art therapy research needs to address the question “‘what works for whom?’ of art therapy treatment” (p. 94), and “involves determining the appropriate art media for particular treatment situations” (p.95). Kaplan suggests that “combining art with verbal psychotherapy runs the risk of losing half the advantages art making can bestow; the psychotherapy session often provides neither the time nor the equipment for executing well-realized art” (p.101).

Kaplan (2000) states that the art therapy profession is in need of an art-based theory to describe art therapy from a theoretical perspective secure in art therapy, as apposed to psychotherapy. We need a theory of artistic creativity that is outside of

the humanistic, cognitive behavioral realm, and perhaps science can help in supporting this development. Kaplan (2000) relates that neuroscience findings indicate that “art expression can facilitate language development,…promote creativity and problem solving…stimulate feelings of pleasure and increased self-esteem …and it can represent an island of successful functioning in a sea of mental defects” (p.62).

Riley (2004) has contributed much to the art therapy community in emphasizing the role neuroscience plays in understanding how and why art therapy is an important mind-body intervention. Riley (2004) reminds the therapist that each brain is unique in how it retains and recalls images. Not only is the art the client creates unique, but also how the individual will interpret or see the image. The art therapist viewing the same image will also view that image differently than the client; a strong reminder that until the art maker shares their dialogue, much is unknown (Riley, 2004).

Riley (2004) relates the importance of left and right brain functioning in art therapy and how this is relevant to practicing art therapists. Riley (2004) conveys that the “art is the visual language in therapy,”(p. 84) emphasizing the left-brain involves intellectual intelligence, and the right brain emotional intelligence. Riley (2004) explains research has shown that when emotional feelings, such as in past experiences, are integrated with previous intellectual decisions, individuals are able to discern whether the decision to be made is advantageous for them. Applying this same principle in art therapy, Riley (2004) conceptualizes that the art process is essentially right hemispheric processing and to add conversation around that image

or contemplate its meaning, is a left hemisphere activity, therefore integrating the two hemispheres to access or activate mind-body healing. Riley (2004) further imparts that sharing this interaction with the client may help the client better understand the choices they are making.

This understanding is also helpful as the therapist informs the client of ways in which they may integrate the mind-body connection in their own healing (Riley, 2004). The mere sharing of knowledge with the client around the unique concepts of the left and right brain, and the various ways these concepts can be integrated into the therapy can be very beneficial (Riley, 2004). This psychoeducational approach is also true as mentioned with educating clients about mind-body connections. Riley (2004) relates how neurons in the brain firing repeatedly in response to a situation, over time tend to continue to fire in that pattern even if insight has been gained. Riley (2004) encouraged her client to draw the neurons and redirect them, providing the client a sense of mastery and understanding over his or her reactions. Riley (2004) also gave examples of explaining body memory to clients with memory impairment, resulting in a shift in the perception client held regarding their challenges with memory (p.189).

Finally Riley (2004) discussed body memory and the opportunity for “art therapy that provides a means to actualize messages sent from the body” (p. 186). The example Riley relates is the individual who has a cold and ignores the body’s symptoms or signals for rest, and therefore continues to push on. Over time the stress on the body can affect the immune system. Riley (2004) explains that the client can transpose their emotional experience onto a figure drawing, and then

correspond those emotions to the physical experience in their body as sensation or felt-movements) This lends to a reframe and possible discussion around options. Therefore, the client acknowledges the illness, expresses the emotional feelings they are experiencing (right hemispheric processing) and experiences a sense of control in deciding how to best handle treatment and approach healing (left hemispheric processing) (Riley, 2004). Riley (2004) reminds that though this process will not cure, it certainly "may reduce stress factors that do influence immune system" (p. 186). Understanding the basic brain functions are crucial for the art therapist as "a rudimentary education in mind-body research can regulate our reactions to our client's artwork and help us to be patient as we learn to speak our clients' language" (Riley, 2004, p.187).

Klorer (2005) using expressive therapy has also explored current research in neuroscience to understand and explain the effectiveness of expressive therapy in working with maltreated children. Klorer (2005) relates research that has revealed that trauma is stored in the right hemisphere of the brain, and therefore poses challenges in verbal therapy to access this information. Current research in neuroscience helps explain why trauma is more easily accessed through nonverbal therapy and why expressive therapy is an important intervention (Klorer, 2005; Van der Kolk, 1994)

Noah Hass-Cohen (2008), an art therapist interested in clinical neuroscience has coined the term "art therapy relational neurobiology principles" (p. 21) (ATR-N). She uses this term to foster a six principle theoretical framework for art therapy in practice, research and theory. Hass-Cohen (2008) suggests that current

neurosceince research supports various art therapy techniques that may prove beneficial in activating various areas of the brain. For example Hass-Cohen (2008) relates that depending on the goals of therapy, whether they be affect regulation, expression or integration, therapeutic artmaking can facilitate activation in various brain functions, such as left of right hemisphere processing, activating neural pathways, or activation of mirror neurons or integration of higher cortical skills. Hass-Cohen (2008) concludes, “interpersonal, sensory-based art therapy interventions may prove to be a way of creating change in the brain” (p.39).

Carr (2008), focusing on the thalamus, the amydgala, and the anterior cingulate cortex (ACC), provides insight into the unique opportunity for art therapy to activate these centers in the brain. In gaining access to these areas of the brain the client benefits in various ways.

> Art therapy practices seem to engage the ACC as well as complex regulatory centers in the PFC [prefrontal cortex] that utilized explicit and implicit memory to problem solve and create novel ways to diminish expressed conflicts. Multimodal contexts available during art therapy invite creative, comprehension-oriented and expressive possibilities that avoid becoming simplistically liner or impulsive. The bilateral orientation of art therapy draws upon the functional differences in both hemispheres to facilitate individualized, coherent and integrative resolutions of present, past and evolution-based disruptions in self-functioning with in a safe, manageable psychosocial context. (Carr, 2008, p.58)

Carr (2008) relates how various neurotramsmitters, neuromodulators and hormones in the body may be activated in various art therapy processes. Carr (2008) specifies acetylcholine, dopamine, epinephrine, adrenaline, norepinephrine, noradrenaline as important neurotransmitters in linking neuroscience research and art therapy. Carr (2008) concludes, “by engaging intrinsic communication processes facilitated by neurotransmitters and hormones, art therapy seems poised to enable positive therapeutic changes while possibly enhancing synaptic plasticity and creating multi-tiered psychological outcomes”(p. 89).

Chapter IV

Synthesis of the Neuroscience and Art Therapy

Grosjean (2005) suggests the use of neuroscience to understand the therapeutic process in psychotherapy. Grosjean (2005) reminds us that in 1936 Saul Rosenzweig coined the term “the Dodo Bird Effect,” suggesting “that common factors were responsible for the effectiveness of various kinds of psychotherapies, and he proposed that all therapies were equally effective” (p.182). So why is this the case? Grosjean (2005) looks at the history of psychotherapy as viewed through the lens of biology to help with this question. Grosjean (2005) details the history and development outlining the importance of a basic understanding of memory and learning and their connections to the autonomic nervous system. Grosjean (2005) relates the effect of “priming”, or learned experiences, both explicit and implicit will influence the individuals’ emotional response to a situation, and “modulate, or shape, the architecture of our neurons and their connections” (Grosjean, 2005, p.189). Grosjean (2005) relates that “the neuronal patterns underlying our behaviors and emotions, our interpretation of reality and subjectivity, evolve, develop, and transform under diverse influences, including, for instance, a psychotherapeutic relationship in its verbal and non-verbal content” (p.186). As mentioned earlier in this paper, this concept was stated in Riley’s (2004) work in relation to art therapy, specifically that active learning can change the neural pathways in the brain.

Grosjean (2005) closes with the idea that “the resources and the plasticity of the synaptic brain, combined with the art and competency of a therapist, will, in due course, be revealed as the keys to a new balance” (p.195). This idea is important for the practicing art therapist to keep in mind in their work with clients.

The following definition of brain plasticity was retrieved from Wikipedia, http://en.wikipedia.org/wiki/Neuroplasticity.

> **Neuroplasticity** (also referred to as ***brain plasticity,*** **cortical plasticity** or **cortical re-mapping**) is the changing of neurons, the organization of their networks, and their function via new experiences…The brain consists of nerve cells (or "neurons") and glial cells which are interconnected, and learning may happen through change in the strength of the connections, by adding or removing connections, or by adding new cells. "Plasticity" relates to learning by adding or removing connections, or adding cells…According to the theory of neuroplasticity, thinking, learning, and acting actually change both the brain's physical structure (anatomy) and functional organization (physiology) from top to bottom. (Wikipedia, Retrieved November 26, 2009)

For example, the process of art therapy, may actually change the brain’s structure, As the client is engaged in novel artmaking neurons in the brain, their networks and functions are changing, providing an opportunity for mind body communication and healing.

Research by Riley (2004), Lusebrink (2004), Carr (2008), Klorer (2005), Kaplan (2000) and Hass–Cohen (2008) has determined that art therapy is relevant

in mind-body connection. Art therapy can be used as a tool to link the bridge between the mind and the body, to facilitate healing.

Rossi's Four Stage Creative Cycle

The future of art as therapy is best mapped by Rossi as shown in the following key points of his four stage creative cycle. Rossi (2002) bases this cycle on "well documented experimental data base of neuroscience and functional genomics as the psychobiological foundation of the four-stage creative process and the breakout heuristic" (p.266). Rossi (2002) states that a heuristic "may help facilitate inner discovery and problem-solving, but it does not determine what the exact outcome of that discovery will be" (p. 334). Rossi explains that an "Implicit processing heuristic may focus attention and an optimal level of inner work, but they do not presume to be a method of facilitating compliance or programming with any particular *suggestion about what explicit or manifest form of behavior should take place*" (p.334). Implicit processing heuristics "only presume to facilitate a momentary suspension for explicit, consciously directed thinking to permit more intense activity on a more unconscious, implicit level" (p.334). For example, an implicit processing heuristic in the first stage of the creative cycle would be an open ended accessing question with the intent of supporting the client in the transition from everyday conversation to enter into therapeutic work.

First Stage: Preparation

The first stage Rossi (2002) outlined, is the stage of preparation. This stage is characterized and fostered by sensitization and ideodynamic experiencing, implicit processing heuristics (wondering, exploring), sensitivity, and awareness. This stage

may begin by modeling to the client an art activity to engaged an activity–dependent approach to art therapy and the creative cycle. “The therapist explores what stage of the basic rest-activity cycle the patient may be experiencing initially in order to facilitate further progress” (Rossi, 2002, p.311).

This stage is characterized by gaining awareness that there is a need for change or growth. The individual is bored and not tuned into his or her own originality. When the individual is feeling lost and a sense of inadequacy predominates their thoughts, perhaps feeling that they have no energy or uncertain about what they should be doing. Once the individual gains awareness to these thoughts and feelings, Rossi (2002) suggests this is the first step in the creative process. Until the individual gains awareness, they may feel “stuck”, as they are using state-dependant memory, learning and behavior patterns that are no longer effective. The clients’ main goal is identifying problems they want to solve.

Rossi (2002) relates the therapist’s task at this point is “asking basic accessing questions that will launch the patients into their own inner journey of problem-solving and healing...the therapeutic intent of these questions is to help people find their own creative edge via an experience of novelty-numinosum-neurogenisis-effect” (p.305). Repeating the words the client uses “from the perspective of neuroscience research, however, this repetition is a kind of *replay*- a type of *implicit processing heuristic* –that facilitates the recall, reassociation, reorganization, and resynthesis that may optimize activity-dependent gene expression and neurogenesis on a molecular level” (p. 307). Rossi (2002) reminds that the therapist is not to try and reduce the clients’ anxiety at this stage, but to

support the client in utilizing their anxiety to work towards problem resolution and healing.

At this stage the art therapist may want to keep the set up and materials the same to provide an opportunity for the dorsal stream to habituate to the art therapy space (Hass-Cohen, 2008). Offering art media may help eliminate the uncertainty, or the sense of inadequacy. To help tune the client into their own originality, beautiful glossy collage materials such as images of nature depicting no movement, for example landscapes, calm the dorsal stream therefore helping the client to experience a sense of mastery, and control (Noah Hass-Cohen, 2008). An art therapy activity to facilitate this kind of experience may be collage. The client may employ collage images to express goals of therapy and emotional experiences of which they are aware.

Second Stage: Incubation

The second stage Rossi (2002) states as incubation. This stage includes accessing state dependent memory learning and behaviour, replay, and imagery. At this stage chronic stress keeps the individual stuck in stage two. SDMLB keep the mind-body from accessing inner resources allowing for experiences of novelty and growth. Depression characteristic of stage two of the creative cycle “is a period of incubation signaling a time for inner work on deep implicit levels” (p. 272). The individual needs the ability to express the new; that which is yet not conscious or explicit. This period is often experienced as a crisis, “the conflict between the newly developing patterns on an implicit level and the older, less adequate explicit worldview” (p. 271). Rossi (2002) suggests that other signs of creativity at this stage

are flash backs of previous troubling memories, and further emphasizes the importance of acknowledging these as possible areas in need of further development or growth. The possibility of growth includes the individuals' ability to understand that their old views are not supporting them, recognizing and embracing a new way, and then, trying this new view to determine its benefit. Rossi (2002) emphasizes that self-consciousness is a crucial development in this stage of incubation as it suggests the possibility of "new patterns of awareness and behavior that set the stage for self-reflection and the possibility of changing in a self-directed way" (p.273). Stage two of the creative cycle is marked by evidence of psychobiological arousal and behavioral state-related gene expression, such as the client's spontaneous experience of unique sensations in the body, suggesting the client may be experiencing the novelty-numinosum-neurogenesis effect (Rossi, 2002). The therapist continues to wonder how to engage and continue this process. The shift to stage 3 happens as the individual focuses on private inner work, working towards the resolution of that which is not working for them.

The brain at this stage is evoking the numinous experience as the individual experiences wonder, fascination, novelty, and curiosity. Rossi (2002) suggests using symptom scaling to engage the client in self-reflection and inner work, and incubation. Symptom scaling is the initial step to accessing state-dependent encoding, and "tends to initiate a mind-body connection that will make further progress along the symptom path" (Rossi, 2002, p. 309). Rossi (2002) uses symptom scaling as an opportunity for clients to bring awareness to their symptoms,

noticing subtle changes during their day and in therapy. In art making the client may work with their symptoms, drawing the symptoms either getting worse or better.

The essential tasks of the therapist in stage two is “recognizing and supporting the patient’s state-dependent encoding of symptoms and problems as well as the inner resources for dealing with them” (Rossi, 2002, p.309). Have the client continue to explore or go with the sensation or experience until they have what they need. “Current neuroscience research, however, implies that the transformations that normally take place during recall, replay, and resynthesis may be a more efficacious approach to facilitating therapeutic transformations” (Rossi, 2002, p.314). The client needs support and encouragement at this stage of often difficult inner work and emotional arousal. Rossi (2002) suggests expressing the courage the client is exhibiting in working with whatever comes and having the client only verbalize what the client feels necessary, just a few words occasionally. Rossi (2002) reminds, “patients do not have to waste precious time and mental energy in being constantly concerned with the task of translating their often vague, implicit (right- hemisphere) experiences into an explicit, verbal (left-hemispheric) form just to please the therapist” (p.317). In supporting the clients inner accessing and replay of their problem actually “empowers people to relay their own unique matrix of experiences, engaging the novelty-numinosum-neurogenesis effect and solving their own problems in their own way” (Rossi, 2002, p.402). I believe the art process to be an exemplary example of the power imagery created from inner accessing of resources is in empowering clients to express themselves and their capabilities in initiating the resolution of their issues. Rossi (2002) expresses the careful

consideration of the therapist to not interrupt the creative inner work the client is engaged in, as this tends to be the therapists biggest error at this stage. Rossi (2002) reminds, that stage two "is usually characterized by arousal rather than relaxation" (p. 320), such as rapid pulse, feeling warm, (sympathetic system arousal) and that "the symptom may be in a creative process of transformation from pain to warmth, comfort and healing" (p.325). Asking the question "lets see what this leads to…" may progress the client on to experience a creative healing response, typical in the third stage of the creative cycle. Rossi (2002) also expresses that as "self-awareness and self-acceptance are very important to optimize inner work" (p.321), and he helps the client with this recognition.

Rossi (2002) posses the following questions, which are crucial to our understanding of art therapy as a mind-body intervention capable of facilitating neurogenesis and healing.

> Does this accessing and replaying of state-dependent memory, learning, and behavior facilitate *behavioral state-related gene expression* as well? If so, would it mean that we are actually facilitating mind-gene communication? State-dependent memory, learning, and behavior are replays of *mind* that may facilitate creative replays of behavior state-related and activity-dependent gene expression to optimize neurogenesis and healing. This is the essence of our original proposal…that *creative replay, which involves natural variation and conscious selection, is the basic mechanism of mind, memory, psychotherapy, and healing.* p. 324

Rossi conveys that at times the therapist may need to reframe negativity and confusion as a creative transition. Rossi (2002) relates possible implicit processing heuristics which may be helpful, such as “Have you ever experienced confusion before you learned something new?” (p. 406), or “Every difficulty opens up new possibilities, does it not?” (p. 406).

If the client asks for help in this stage Rossi (2002) provides examples of a 4 step implicit processing technique that can be implemented, with the main goal to ensure the client is supported in their request for help, supported in their ongoing experience, “encouraged to maintain an internal locus of control by *allowing* the emotional experience to take place with in their own self-directed therapeutic process” (p.409), and encouraged to self-reflect to work towards a solution.

When the client is stuck, offering new media, or the positioning of the material or suggesting the client stand when creating art, will all excite the dorsal stream (Hass-Cohen, 2008). Hass-Cohen (2008) suggests this creates an opportunity for therapeutic work. As the client engages in the art and ultimately quiet inner work the art therapist is best to remains quiet to allow the client the time they require for their inner process.

Third Stage: Illumination

The third stage Rossi (2002) identifies as illumination. This stage includes the novelty-numinosum-neurogenesis effect, discovery, insight, transformation, intuition and reframing. This stage is characterized by the recognition of new possibilities, encouraging the individual to break out of old patterns. This experience has lead to

the explanation or description of these moments of new insight as numinosum, flow, or peak experiences, to name a few. Rossi (2002) relates:

> These creative states are the experiential aspect of the novelty-numinosum-neurogenesis effect. The novelty-numinosum-neurogenesis effect is a psychogenomic bridge between the experiences of mind (novelty, numinosum) and matter (neurogenesis)….*The sense of the numinosum in the ongoing flow of relative experience is the key selection factor, alerting us to which activity, thought, intuition, etc,. merits for further examination and possible development.* (p. 276)

At this point the client is fascinated by what they are experiencing. "Under the best of circumstances, stage three is typically experienced as a creative moment or insight, new meaning, problem solving, and healing – all of which are mediated by the novelty-numinosum-neurogenesis-effect" (Rossi, 2002, p. 275). Rossi (2002) identifies and reminds that peak experience – even in everyday life - require that an experience be novel, surprising, enriching and a novel form of exercise. I suggest art therapy provides the client an opportunity to experience novel artmaking as surprising and enriching, and in turn to facilitate the novelty-numinosum-neurogenesis-effect.

> The many experiences of enjoyment and light on explicit conscious levels are numinous moments that are accompanied by the occurrence of gene expression, neurogenesis, and healing at an implicate level. This is the essence of what we proposed as the novelty-numinosum-neurogenesis hypothesis (Rossi, 2002, p.278).

The individual often experiences a sense of unreality in this stage as the implicit learning becomes conscious which may even be expressed as laughter or surprise (Rossi, 2002).

Rossi (2002) indicates there are several behavioral cues that the therapist may notice in the client that will indicate the third stage of the creative cycle. Some of these indicators may present as a slight grin, a shift in body positioning, absolute stillness, or a slight head nod, as the client experiences a moment of insight. Rossi suggests several possible implicit processing heuristics to support the client in this process. Larger body movements Rossi (2002) suggests are indicative of the person moving from an experience of anger or depression in stage two to a more relaxed and open way of being in stage three.

Rossi (2002) suggests the therapist support and help client recognize the shift from previous negative experience in stage two to the current tentative discoveries and the possibility of positive state of wellbeing in stage four. The therapist ‘s most crucial and important work at this stage is to have the client “replaying the positive possibilities of *natural variation* and conscious creative *selection* of optimal psychobiological states” (p.373). In other words, the therapist is to help the client “*recognize and facilitate their own personal experiences of choice and creativity!*” (p. 415).

The brain, at this stage of the process experiences neurogenesis. Rossi (2002) explains, “vivid conscious experience can turn on genes that code for proteins that lead to neurogenesis-the generation of new neurons and their connections in the brain. This new growth within the brain is the anatomical and

molecular basis of our every changing memory, learning and behaviour" (p.12). Activity dependent gene expression can be understood as "the inner rehearsal and creative replay of novel and surprising life experiences between the hippocampus and cortex of the brain plays a significant role in optimizing activity-dependent gene expression and neurogenesis in the creation and recreation of memory, learning and behavior" (Rossi, 2002, p. 151).

Also during this stage the client comes to a place of self-reflection whereby they are able to choose the best way to facilitate their own healing through their new learning or insight (Rossi, 2002). This leads the client to stage four of the creative cycle, where they verify their new learning. At this stage, an art therapist may consider having the client working with challenges in relationship to create a collage with faces of individuals chosen to represent family members.

Fourth Stage: Verification

The fourth stage Rossi (2002) describes is verification. This stage includes reframing symptoms into signals and problem into resources, assessment, change, and reintegration. Rossi (2002) relates that at this stage, the individual takes what they have learned from stage three and tries it out, ultimately activating activity-dependent gene expression and neurogenesis. In this stage what is known implicitly, the individual uses to "co-create consciousness" into their new identity or worldview. "The developmental challenge is for the individual to learn to cope with these inner trials by engaging in activities that stimulate activity-dependent gene expression-art, drama, sports-whatever evokes the novelty-numinosum-neurogenesis effect" (Rossi, 2002, p.281).

Rossi (2002) expresses:

> The inner rehearsal and creative replay of novel and surprising life experiences between the hippocampus and the cortex of the brain plays a significant role in optimizing activity-dependent gene expression and neurogenesis in the creation and recreation of memory, learning, and behavior. (p. 151)

Rossi (2002) relates that the client at this stage may display changes in posture, perhaps even stretching. The client generally feels a sense of well-being or relief. Rossi (2002) reminds that if symptom scaling was used in stage one, now is an important time for the client to rescale their symptoms as a form of validation of their therapeutic process. The client now has the task of integrating their new learning into a new worldview.

Rossi reminds:

> The greatest source of misunderstanding about the creative process by both patients and therapists: Patients and therapist are co-creators, not directors of the natural dynamics of gene expression neurogenesis, and healing. *The patient's co-creative take is to recognize and value the new that arises in stage three and then plan in stage four how the new can be practiced in real life. The therapist's co-creative task in stage four is to (1) facilitate experiences to validate the value of the psychotherapeutic process and (2) help reframe and resynthesize symptoms into signals and psychological problems into resources.* (p.423-424)

At this stage the art therapist may suggest the client create the collage with actual images of their family members. Perhaps the client using oil pastels through out their process might now switch to paint to allow " integration of affects and continuation" of their process as suggested by Hass-Cohen (2008).

Art Therapy Activities to Activate Stages of the Creative Cycle

The following are examples of art therapy interventions that foster the mind-body connection:

1. Interpersonal Neurobiology Sensitive Art Therapy Directives

Hass-Cohen (2008) relates "interpersonal, sensory-based art therapy interventions may prove to be a way of creating changes in the brain. Sharing information about how the brain changes with therapists and with clients can also generate powerful art therapy psychoeducational interventions" (p.39). The following are various ways in which an art therapist can present art activities that are novel and stimulating.

Hass-Cohen (2008) illustrates that offering the art media to the client facilitates expressions of relational empathy mirror neurons. Siegel (2007) defines the mirror neuron system as follows;

> Mirror properties in the nervous system are essentially defined as the ways in which our social brain has processes in which it perceives the intentional, goal directed actions of others and links this perception to the priming of the motor systems to engage in that same action. This is the derivation of the term "mirror neuron" in that what we see we become ready to do, to mirror others' actions in our own behaviors. (p. 347)

Traditionally, the use of media has been used to set provide control and safety to the client. This may not allow “integration of affects and cognitions” (Hass-Cohen, 2008, p. 38). For example, a client may not engage in an emotive space if the medium provided in not conducive to affective expressivity and the opposite may be true if the is medium is too emotive, the client may have difficulty integrating cognitive awareness to their process.

2. Visual System: The Dorsal Stream and Ventral Stream

An organized and consistent studio space is important. The art therapist may want to keep the set up of the space and materials the same to provide an opportunity for the dorsal stream to habituate to the art therapy space (Hass-Cohen & Loya, 2008). Offering art media may help eliminate the uncertainty, or the sense of inadequacy. To help tune the client into their own originality, beautiful glossy collage materials such as images of nature depicting no movement, for example landscapes, calm the dorsal stream therefore helping the client to experience a sense of mastery, and control (Hass-Cohen & Loya, 2008). The ventral stream processes colour, including brightness, shape and meaning and is therefore important in recognizing what one is looking at (Hass-Cohen & Loya, 2008). Emotional connections can be made in relation to the images we view. The art therapist when “asking clients to describe what they are seeing most likely engages the ventral stream’s deliberate processing, and helps the person slow down and assign meaning to the event depicted” (Hass-Cohen & Loya, 2008, p.98).

3. Art Media: Fluidity versus Structure for Safety.

Hass Cohen & Loya (2008) suggest that based on neuroscience, “it is likely that the firmer the media, the safer the assessment given by the amygdala. To further associate safety with dorsal/ventral visual stream functioning, we suggest including media location and implied movement along with novelty shape, color, and meaning” (p. 99). Hass-Cohen & Loya (2008) suggest dorsal safety continuum progress as follows; pencils color pencils, collage full journals, precut collage images, felt pens oil pastels, plasticine (oily clay), chalk pastels, paint, watercolors, and clay. This progression is in relation to dorsal safety and progresses from no movement, to implied movement, undefined shapes and human movement (Hass Cohen & Loya, 2008). The ventral system included a progression from novel images which are less safe to familiar images, and progress from shape, color and texture to content (Hass-Cohen & Loya, 2008).

4. Faces and/or Self-portraits

Hass-Cohen & Loya (2008) “hypothesize that drawing self-portraits involves a considerable amount of cognitive effort compared to drawing familiar faces” (p. 101). To ask a client to render a self-portrait may be too demanding. Hass-Cohen and Loya (2008) further outline the following areas of the brain that are activated in working with various facial images. Hass-Cohen and Loya (2008) present that unfamiliar faces activate perceptual-emotional processing, where as the:

> Processing of familiar faces activates emotional–cognitive processing areas, insula, middle temporal, Inferior parietal and medial frontal lobe, whereas self-face processing involves increased activation of cognitive areas, the right

superior frontal gyrus, medial frontal and inferior parietal lobes and the left middle temporal gyrus. (p.101)

Research is also being done to examine facial images created by clients, as far as the clients use of sharp crisp lines and soft burry lines (Goffauz et.al. 2003) or lack of these kinds of quality in their lines. Findings suggest that if a client's drawing is sharp, or cartoon like, encouraging the client to "incorporate naturalistic face characteristics (soft, blurry, low spatial features) may assist in the exploration of intimacy and connectedness" (Hass-Cohen & Loya, 2008, p.104).

5. Collage

When working with collage, Hass-Cohen & Loya (2008) suggest various ways in which to capitalize on brain processing and functioning. Merely having the client choose images and letters for a collage, and sharing what they are drawn to, may incorporate the temporal lobe, right hemispheric dopaminergic activation (Louilot and Besson, 2000). When working with relationship issues the art therapist may have the client work first with non-familiar images so as to not overwhelm the client, and then move to familiar images as therapy progresses. The right cortical region is suggested to be involved with processing emotional facial expressions (Adolphs et al, 1996). Integrating both left and right hemispheric processing may be done by presenting the right hemisphere with upright faces, as the information is then transferred to left hemisphere (McCarthy et al, 1997). The opposite is also suggested to present inverted images to the left hemisphere, as information is then transferred to the right hemisphere. Yovel, Levy, Grabowecky and Paller (2003) suggest images of printed letters stimulate left hemisphere processing. Hass-Cohen

& Loya (2008) also suggest the physical way in which the art therapist introduces facial images to a client will impact the clients processing of the image. For example the right hemisphere is better at processing sad faces, and the therefore the therapist would best be able to support the client in presenting such an image to the client's left of center face. Research suggested that the left and right hemispheric processing was needed for positive possibilities (Hass-Cohen, 2008).

As collage and picture images of faces evoke emotional reactions similar to those in real life, art therapy collage allows "clients opportunities to practice interpreting human expressions, control and master therapeutic communication, and enhance affective attunement" (Has-Cohen & Loya, 2008, p. 105 -106).

6. Bilateral Art

McNamme (2004, 2006) suggests an affective intervention to stimulate both the left and right hemispheres of the brain, or cerebral cortex. The use of the bilateral art intervention involves the client thinking about the problem and scaling it. Often the sides to the problem, are related to as positive and the negative. The art activity involves the client using the left hand to depict one side perhaps positive and the right hand to depict the negative side. Then the client is to trace over the drawings with the opposite hand to which created each image. Next the client is asked to trace the drawing using both hands together. After this the client is asked to rescale the strength of the problem or belief on both sides, and reflect on the problem, perhaps through further art or narrative. The thought is that the client has the opportunity to reshape neural networks or pathways in utilizing both hemispheres of the brain, incorporating novelty and numinosim (Rossi, 2002)

through the use of dominant and non-dominant hands, to reshape or experience a belief (McNamme, 2004, 2006).

This intervention may be most useful when the client was aware of the problem cognitively but not the clients felt awareness. This may correspond to stage 3 of Rossi' creative cycle.

Rossi's 4 Stage Creative Cycle	Characteristics of each Stage	Area of the brain Involved	Art Intervention	Why?
Preparation	Sensitization Exploration Awareness	Dorsal stream – motion	Offering art media to the client Collage-glossy images, landscapes, no motion	Facilitates expressions of relational empathy mirror neurons Using landscapes (no motion) calms the dorsal stream & supports transition into therapeutic art making
Incubation	Accessing SDMLB Replay Imagery	Ventral stream-shape, color, meaning Right hemisphere Sympathetic system arousal.	Symptom scaling Bilateral art Figure drawing	Integrate left & right hemisphere in working through the problem - initiating opportunity for new neural networks Transpose emotional experience to correspond with physical experience

Illumination	Discovery Illumination Insight Transformation	Hippocampus and cortex temporal lobe	Collage- familiar faces	Encourages affect
Verification	Reframing Assessment Reintegration Activity dependent gene expression Neurogenesis	Hippocampus (learning) and the cortex Right cortical regions	Collage with actual images of individuals Change in medium- e.g. oil pastels to paint Inner resource Drawing	Evoke emotional reactions similar to those in real life Reframe of how the client views the problem, what is needed for change and final goal

Research has yet to explore the possible outcomes when art therapy and state dependant memory, learning, and behaviour are used in conjunction with each other, in accessing and activating the mind-body response.

The Practicing Art Therapist

With regard to practicing art therapists, these ideas may inform the art therapists in terms of the therapists' orientation to facilitating the clients' access to their own body's healing. The length of a session, the interventions used, the education the therapist can provide regarding the mind-body connection, the way in which the client creates art and speaks about the art, to the way the art therapist responds to the client and their art, are all crucial in activating and accessing the mind-body response To best incorporate these processes into an art therapy session, the art therapist may want to begin by reviewing the length of a session. Initiating the ultradian healing response would suggest that the session be a 90 minute session, and at least 20 minutes of creative work (Rossi, 1993).

Grosjeans' (2005) research would suggest the that the art therapist may want to educate the client on the basics of mind-body communication, perhaps sharing

the basics of left and right hemispheric processing. Reminding the client of the advantages of developing a level of trust with regard to the artmaking process and the body's ability to activate mind-body healing if given the opportunity (Malchiodi, 2007).

Research has shown that accessing and encoding state-dependent memories have been effective when the client creates art with their own inner images, (Rossi, 1993). The art therapist may suggest interventions that support the client in recognizing their own mind-body response through the use of their own inner images. The example, given by Rossi (1993), suggests incorporating an exercise that resources the client to tap into the ultradian healing response. Rossi's (1993) suggestion is that the client draw the comfort in his/her body, spreading and deepening, and wondering about how previous experiences can be used to help the client in this current challenge. The client may notice time has pasted, recognize and acknowledge the healing and comfort changes that have transpired (Rossi, p.216). Rossi (1993) reminds that it is the:

> Happy memories of health, well-being, joyful experiences, creative work, and effective coping...[that] are the raw material or inner repertory of resources that our accessing formulas seek to utilized in healing. The fundamental task for each individual is to learn how to access and utilize his or her own unique inner repertory of psychobiological resources that can ultimately modulate biochemical processes within the cell. (p. 216)

Rossi emphasizes the use of the clients' own story to initiate gene expression to reshape their experience (Rossi, 2002). Trusting the process and drawing from

within, as Prinzhorn held, “the creative process of art making is basic to all people...and that art was a natural way to achieve psychological integration and wellness,” (Malchiodi, 2007, p.27). Art therapy interventions may in the future be specific to the various systems of the body, as suggested by the following examples. Based on the client’s symptoms one set of interventions may be found to facilitate healing when working with the automatic nervous system and another set of interventions may be more successful when working with symptoms of the immune system.

Riley (2004) suggests the use of the clients’ body image or figure drawing to further elicit right and left hemispheric processing to activate mind-body healing. Art process can be understood as a form of self-hypnosis, as Malchiodi (1999) relates her experience working with patients using art therapy as a mind-body intervention in “achieving a relaxation response – that is, a relaxed state of being that is known to build the immune system and alleviate some symptoms of illness” (p.18).

Further to Grosjean ‘s (2005) research, Rossi’s (1993) theory of intentional modulation is easily applied to art therapy intervention. Encouraging the client to draw their immune response, and the client making this kind of drawing, may be enough to stimulate changes that may further the mind-body response. This act of drawing, in turn, could affect psychological processes as stated by Rossi (1993) such as hopelessness and depression. Clients may also use their art process to provide direction to their own immune system to respond to various infections or disease. In art, a client could symbolically create their immune system stepping up to

flight a tumor, or perhaps depicting in their art images the drugs moving through their body targeting a tumor or tumor site (Riley, 2004).

Art therapy interventions could also be tailored to Temoshok' s (1991) research, which revealed the benefits of expressed emotion in relation to the clients' tumor. Further research could direct how the client may incorporate art therapy interventions specifically to express emotion and activate the mind-body response for healing in relation to specific illness. In art therapy, perhaps research could be done on how best clients could work systematically through their body and immune system to fight disease. Opportunities would be incorporated for the client to create art, based on the emotional space of positive healing and safe outcomes, providing a building block from which to "transduce" emotions. The hope being, the incorporation of these "transduced" emotions into a positive and effective mind-body healing interaction. This approach and research on art therapy may further suggest the use of art to be employed as a reframe for the client to experience a positive interaction with their current health challenge, and therefore potentially have a positive effect on the immune system. This reframe may be outlined in a similar manner to Rossi's (1993) "Symptom Scaling and Healing" tutorial mentioned earlier in this paper. Art process could also be focused upon to work with the systems SDMLB in using the Inner Resource Drawing 3 part technique also mentioned earlier (Rossi, 1993). For example, 1) the client could draw the symptom as it is currently experienced, 2) then draw when it is resolved, and then, 3) how to get from 1 to 2. This is an excellent opportunity for the client to reframe his/her experience.

Educating the client that the mind is guiding the art, that the mind actually uses art expression as a way of healing or balancing our systems whether we are conscious of it, or not; that is, it happens and is important (Malchoidi, 2007). Educating the client on attuning to their own art process, and identifying stages or cycles they encounter will be helpful in using art therapy as a mind-body intervention. Malchiodi (2007) relates it is generally agreed that the creative process usually involves the stages; preparation, incubation, illumination, and verification. Therefore, it is crucial the client sees (i.e. understand and accepts) art making as a way the body can communicate between the systems.

Explaining to the client the various stages of the art process is beneficial. Artmaking has two parts: the physical part - the fingers holding a brush and moving it across the page, and then, the emotional response to artmaking, how we feel and think about the art once we create it (Malchiodi, 2007). Lusebrink (1999) further suggests the art process involves four levels of experience: a kinesthetic/sensory level, a perceptual/affective level, a cognitive or symbolic level, and a creative level. It will be beneficial for some clients to think about these levels of experience to fully understand their own creative process and understand and identify the moment when the shift happens and that systems are working in unison, that is to say, the mind-body connection has been activated. This may be explained to the client as the space we are in when we begin to lose track of time. The *still moment*… that moment that you know that all is well, everything will be all right (Laird, 2001), or the *zone* as describes in sports (Malchiodi, 2007). Acknowledging and recognizing this is the space the body-mind accesses to tap into it's own resources to heal, is crucial

for the client to be able to fully engage and activate the mind-body healing response (Rossi, 1993).

Rossi (1993) explains it is important for the client to then identify ultradian healing as the space when we lose track of time when creating art, in order that they may acknowledge that healing can occur or perhaps, has occurred already. The client is encouraged to let go of preconceived ideas of how the art should appear, to let go of judgment, trusting in the process of drawing from within, to encourage one's own inner images to evolve (Malchiodi, 2007). Some clients, in some settings, a large number of clients most likely have their own inner images and resources from which they may draw upon to activate the mind-body response (Rossi, 1993).

Activating the mind-body response in artmaking, initiates the creative process which stimulates various systems throughout the body that communicate, and encourage the mind-body connection, and ultimately healing. Creating art may allow the systems of the body to work together as during emotional releases, abreactions, or cathartic responses. Art therapy has been noted as giving opportunities for cathartic releases of anger (Hiltebrand, 1999; Liebmann, 2008). Hiltebrand (1999) explains that through art, clients can express emotions that may be difficult to talk about, having the art as a safe and effective vehicle for exploration of feelings. Pennebaker (1997) relates the opening up of the client in writing and talking about an event can improve immune system functioning and that the same is true of artistic expression. Hiltebrand (1999) suggests that the expression of emotion provides the client with a sense of mastery, and therefore, decreases the client's sense of helplessness, ultimately increasing the client's ability to cope with stress,

and at the same time, possibly increasing their immune function. For all of the above reasons, Hiltebrand (1999) states art therapy as important intervention in working with clients.

When in discussion with clients about the art that has been created by the clients, perhaps art therapists would incorporate words such as *wondering*, *relaxation*, and *comfort* to encourage right hemispheric processing (Rossi, 1993). This may encourage clients to reframe the encoding of a problem. In other words, the client experiences an opportunity to reshape the way they understand a problem, The client is accessing his or her own inner resources that have proven effective in the past in solve challenging situations or problems.

Chapter V

Summary and Conclusion

In summary, research has demonstrated that the mind-body connection does exist. The systems of the body do communicate with each other. If we can hold that a symptom is a signal to us to initiate a response to bring our body back to balance or harmony, we hold the key to the mind-body connection. The symptom is the first step to bridge the mind-body connection. State dependent memory learning and behaviour, sets the map for letting the body do what it naturally needs to do. Working within the body's natural rythms, the ultradian rythms, and encouraging the individual to draw upon their own inner images as resources we can activate the body's own healing response (Rossi, 1993). The art therapist sensitive to these subtle spaces can support the client is maximizing the mind-body response, and educating their client on the basic concepts of right hemisphere and left hemisphere processing in activating the mind-body response, and the importance of listening to their bodies 'symptoms'.

It is possible that gene expression, and messenger molecules (neuropeptides) and their receptors in combination with the chemical substrates of emotion may provide information to study why and how art therapy is successful in mind-body interventions. Research in the field of neuroscience, and the discipline of psychoneuroimmunology have illuminated important features in the mind-body connection. The conclusions of this review could serve many purposes. Firstly, it is possible that these finding may carry over and be helpful in understanding the healing effects of creative expression in art therapy intervention. Further understanding of the mind-body connection may inform implications for practice in art therapy and as a result clients would benefit. Secondly, it is promising that with further research, we may be able to fine tune art therapy interventions to specifically target systems in the body to encourage health and healing. The mind-body connection has revealed that the systems of the body do not act independent of each other.

Thirdly, one may also suggest that collaborative research in the fields of neuroscience, and art therapy could prove to be beneficial to both the discipline of art therapy and the greater healthcare field. Future research in the art therapy community may involve MRI and PET scans to determine the effects of creative expression in art therapy on the brain. These tests are however expensive, and in high demand. Blood samples may be taken to identify hormone levels that may be involved in creative expression. DNA microarray technology is yet another possibility and example of new technology that is continually becoming available that may provide valuable information in the pursuit to understand how art therapy works.

Finally, it is hoped that this review will inspire further research activity in the art therapy community. Rossi (1993, 2002) provides a theoretical model and structure that can place both neuroscience and art therapy, whereby the language bridges both areas. Future research may provide more clarity around what the advantages or disadvantages of this approach over other art therapy models of practice may be. These findings may vary with various populations based on specific concerns, challenges or settings. Advantages and disadvantages may be explored in following this format in hospital settings versus private practice, and how to best apply these findings. Another direction to expand in future research may include a detailed exploration of how self-regulation, trauma and mindfulness in the work of Van der Kolk (1994) may interface with the work of Rossi (2002) outlined in this paper.

Studies to replicate and further current art therapy research are necessary. Though there is currently a lack of published empirical research conducted in the art therapy community, this trend is changing. Leaders in the art therapy community are conducting research and devoting time and energy into encouraging others to pursue research (Hass-Cohen, & Carr, 2008; Kaplan, 2000).

As stated by Malchiodi (2003) “the impact of neuroscience on all aspects of health care will literally repaint the picture of how art therapy is used in the treatment of emotional and physical disorders in the future” (p.22).

As research in neuropsychology and art therapy continue, greater understanding will provide further insight into how particular art therapy interventions help foster the mind-body connection and healing.

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